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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/733,673	12/08/2000	Yoshitami Sakaguchi	JP919990237US1(13998)	2711

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Richard L. Catania, Scully, Scott, Murphy &
Presser
400 Garden City Plaza
Garden City, NY 11530

EXAMINER

SHAPIRO, LEONID

ART UNIT

PAPER NUMBER

2673

DATE MAILED: 08/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/733,673

Applicant(s)

SAKAGUCHI ET AL.

Examiner

Leonid Shapiro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. Figure 20 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to because Drawing 13 has (a) and (b) at wrong places. (a) should be placed at left upper corner and (b) at left in the middle of the Drawing 13. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: All abbreviations like LSI, TFT, PC, XGA, WOA ... should be decipher.

Appropriate correction is required.

5. The disclosure is objected to because of the following informalities:

For all item numbers reference Figures number need to be shown. For example on page 12, Line 23, page 13, Line 8 and so on.

On page 19, Line 23 A and B should be low case as in the Fig. 13.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 9 rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification/disclosure does not provide support for driver ICs, an upstream driver IC includes a dummy circuit for substantially matching a video phase and a clock phase recited in claim 9, how to make or use applicant's claimed invention by one skilled in the art.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 4-5 rejected under 35 U.S.C. 102(b) as being anticipated by Shimizu (US Patent No. 5,801,674).

As to claim 4, Shimizu teaches about a liquid crystal display device with:

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- a crystal cell forms an image display area on substrate (See Fig. 1, items 1, 2, in description See Col. 3, Lines 39-52)
- a driver for distributing an input video signal to a plurality chain-connected driver IC's, and for applying a voltage to liquid crystal cell IC's (See Fig. 1, items 3-6, ENABLE1-ENABLE6, in description See Col. 3, Lines 67-68 and Col. 4, Lines 1-18)
- wherein driver distributes video signal to plurality of driver IC's with providing a masking signal from an upstream driver IC to a downstream driver IC of plurality of driver IC's, wherein masking signal masks video signal to be provided by upstream driver IC (See Fig. 1, items 3-6, ENABLE1-ENABLE6, in description See Col. 3, Lines 67-68 and Col. 4, Lines 1-18).

As to claim 5, Shimizu teaches about downstream driver applies a voltage to LC cell in accordance with input video signal after receiving masking signal from upstream driver IC (See Fig. 1, items 3-6, ENABLE1-ENABLE6, in description See Col. 3, Lines 67-68 and Col. 4, Lines 1-18).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. Claims 1-2, rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Zavracky et al. (US Patent No. 5,751,261).

As to claim 1, Shimizu teaches about a liquid crystal display device with:

- a LC cell which forms an image display area on substrate (See Fig. 1, items 1, 2, in description See Col. 3, Lines 39-52)
- a driver for applying a voltage to liquid crystal cell based on an input video signal, wherein driver includes the plurality of IC's and are cascade-connected using signal lines (See Fig. 1, items 3-6, ENABLE1-ENABLE6, in description See Col. 3, Lines 67-68 and Col. 4, Lines 1-18).

Shimizu does not teach about drivers being mounted on substrate.

Zavracky et al. teaches about silicon substrate being transferred to a glass substrate as a single piece (See Fig. 1, items 122a and 122b, in description See Col. 2, Lines 1-10). It would have been obvious to the one ordinary skill in the art in the time of invention to implement Shimizu controller using Zavracky et al. approach in order to reduce size of the LCD display device.

As to claim 2, Shimizu does not teach about a power feed line via metal layer of each driver IC.

Zavracky et al. shows how to implement an aluminum interconnect (See Fig. 8, items 100, 1047, 1400, in description See Col. 15, Lines 47-51). It would have been obvious to the one ordinary skill in the art in the time of invention to implement Shimizu controller using Zavracky et al. approach in order to reduce size of the LCD display device.

9. Claims 3, 6-7 rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu and Zavracky et al. as aforementioned in claim 1 in view of Babcock et al. (US Patent No. 5,623,519).

As to claim 3, Shimizu and Zavracky et al. do not teach about receiving video signal consisting of serial data, and wherein video signal is synchronized based on a synchronization pattern included in the serial data.

Babcock et al. shows how to synchronize serial stream based on a synchronization pattern included in the serial data (See Fig. 1, items 410, 430, in description See Col.1, Lines 48-67 and Col.7, Lines 42-54). It would have been obvious to the one ordinary skill in the art in the time of invention to implement Babcock et al. approach Shimizu and Zavracky et al. apparatus in order to reduce size and increase reliability of the LCD display device.

As to claim 6, Shimizu teaches about a liquid crystal display device with:

- a LC cell which forms an image display area on substrate (See Fig. 1, items 1, 2, in description See Col. 3, Lines 39-52)
- a driver for distributing an input video signal to a plurality of driver ICs that are cascade-connected, and for applying a voltage to LC cell by employing driver ICs (See Fig. 1, items 3-6, ENABLE1-ENABLE6, in description See Col. 3, Lines 67-68 and Col. 4, Lines 1-18).

Shimizu does not teach about the plurality of driver ICs are cascade-connected by a video transmission line provided on substrate.

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Zavracky et al. shows to how to implement plurality of the drivers with interconnections on silicon substrate (See Fig. 1, items 122a and 122b, in description See Col. 3, Lines 1-10). It would have been obvious to the one ordinary skill in the art in the time of invention to implement Shimizu controller using Zavracky et al. approach in order to reduce size of the LCD display device.

Shimizu and Zavracky et al. do not teach about plurality of driver ICs are controlled by serial data that are transmitted along video transmission line.

Babcock et al. shows how to synchronize serial stream and control drivers based on a synchronization pattern included in the serial data (See Fig. 1, items 410, 430, in description See Col.1, Lines 48-67 and Col.7, Lines 42-54). It would have been obvious to the one ordinary skill in the art in the time of invention to implement Babcock et al. approach in Shimizu and Zavracky et al. apparatus in order to reduce size and increase reliability of the LCD display device.

As to claim 7, Shimizu does not teach about a second signal line for which the polarity of first signal line has been inverted. As notoriously well known in the art a line with polarity of first signal line has been inverted could be easily implemented. It would have been obvious to the one ordinary skill in the art in the time of invention to add a second signal line for which the polarity of first signal line has been inverted to Shimizu, Zavracky et al. and Babcock et al apparatus in order to reduce size and increase reliability of the LCD display device.

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10. Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu, Zavracky et al. and Babcock et al as aforementioned in claim 6 in view of Shin et al. (US Patent No. 5,974,464).

Shimizu, Zavracky et al. and Babcock do not show driver with a clock line and power makes a cascade-connection to plurality of driver ICs.

Shin et al. shows a clock line and power makes a cascade-connection to plurality ICs (See Fig. 1, in description See Col. 4, Lines 55-67). It would have been obvious to the one ordinary skill in the art in the time of invention to implement cascade connections as shown by Shin et al. in Shimizu, Zavracky et al. and Babcock et al apparatus in order to reduce size and increase reliability of the LCD display device.

11. Claims 10-16 rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Babcock et al.

As to claim 10, Shimizu teaches about liquid crystal control with:

- receiver for receiving a video signal from a host to display an image (See Fig. 2, items 11, 12, 14, in description See Col.4, Lines 23-26)
- a sequencer (See Fig. 2, items 11, 12, 13, in description See Col.4, Lines 23-26)
- output control means for converting video signal received from receiver into a serial video signal (See Fig. 2, item 14)

Shimizu does not show how upon the receipt of a control signal from host, generating header information for packet data that are to be output to a LCD driver, for adding header

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information generated by sequencer to serial video signal, and for outputting resultant serial video signal to LCD driver.

Babcock et al. shows how to synchronize serial stream and control drivers based on a synchronization pattern included in the serial data (See Fig. 1, items 410, 430, in description See Col.1, Lines 48-67 and Col.7, Lines 42-54). It would have been obvious to the one ordinary skill in the art in the time of invention to implement Babcock et al. approach in Shimizu apparatus in order to reduce size and increase reliability of the LCD display device.

As to claim 11, Shimizu teaches about sequencer and output means (See Fig. 2, items 13, 15, 16).

Shimizu does not teach about generation of header information synchronizing drivers, and wherein output means provide header information used for synchronization. Babcock et al. shows how to synchronize serial stream and control drivers based on a synchronization pattern included in the serial data (See Fig. 1, items 410, 430, in description See Col.1, Lines 48-67 and Col.7, Lines 42-54). It would have been obvious to the one ordinary skill in the art in the time of invention to implement Babcock et al. approach in Shimizu apparatus in order to reduce size and increase reliability of the LCD display device.

As to claims 12-13, Shimizu teaches about a video transmission method, for transmitting a video signal to an LCD driver ICs by transmitting a video signal via parallel interface, but transmit ENABLE control signal via serial interface (See Fig.1, item ENABLE1-ENABLE4). It would have been obvious to the one ordinary skill in the art in the time of invention to implement transmission of video signal using serial interface, including a horizontal

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blanking period approach in Shimizu apparatus in order to reduce size and increase reliability of the LCD display device.

Shimizu does not show how to transmit a synchronization pattern during horizontal blanking period in order to synchronize video signal for driver ICs. Babcock et al. shows how to synchronize serial stream and control drivers based on a synchronization pattern included in the serial data (See Fig. 1, items 410, 430, in description See Col.1, Lines 48-67 and Col.7, Lines 42-54). It would have been obvious to the one ordinary skill in the art in the time of invention to implement Babcock et al. approach during horizontal blanking period in Shimizu apparatus in order to reduce size and increase reliability of the LCD display device.

As to claim 14, Shimizu teaches about a video transmission method, for transmitting a video signal to an LCD driver ICs that are cascade-connected:

- transmitting a video signal via parallel interface, but transmit ENABLE control signal via serial interface (See Fig. 1, item ENABLE1-ENABLE4). It would have been obvious to the one ordinary skill in the art in the time of invention to implement transmission of video signal using serial interface, including a horizontal blanking period approach in Shimizu apparatus in order to reduce size and increase reliability of the LCD display device
- applying to an LCD a voltage based on video signal that is received and that is processed by each of driver ICs (See Fig. 1, items 3, 4, 5, 6, in description See Col. 3, Lines 41-52).

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Shimizu does not teach about video signal is constituted by bit blocks having a plurality of attributes and wherein driver ICs are controlled by using bit blocks.

Babcock et al. shows how to synchronize serial stream and control drivers based on a synchronization pattern included in the serial data (See Fig. 1, items 410, 430, in description See Col.1, Lines 48-67 and Col.7, Lines 42-54). It would have been obvious to the one ordinary skill in the art in the time of invention to implement Babcock et al. approach for the bits blocks and attributes in Shimizu apparatus in order to reduce size and increase reliability of the LCD display device.

As to claim 15, Shimizu and Babcock et al. do not teach about wait command. It would have been obvious to the one ordinary skill in the art in the time of invention to add a wait command for waiting for driver IC, generated by each of driver IC and transmitted to a downstream (as ENABLE control line in Shimizu Fig.1) in Shimizu and Babcock et al. apparatus in order to reduce size and increase reliability of the LCD display device.

As to claim 16, Shimizu and Babcock et al. do not teach about LCD driver using a packet, and wherein plurality of driver ICs are controlled by a protocol that employs the header of the packet. It would have been obvious to the one ordinary skill in the art in the time of invention to add a protocol that employs the header of the packet in Shimizu and Babcock et al. apparatus in order to reduce size and increase reliability of the LCD display device.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- The Mori et al. (US Patent 6,335,720) reference discloses data transfer method, display driving circuit using the method and image display apparatus.
- The Ohno et al. (US Patent 6,232,940 B1) reference discloses a picture data transfer apparatus and display apparatus.
- The Kurumisawa et al. (US Patent 6,262,704 B1) reference discloses a method of driving display device, display device and electronic apparatus.
- The Brownlow et al. (US Patent 6,232,946 B1) reference discloses active matrix drive circuit.
- The Takasugi (US Patent 6,310,596 B1) reference discloses a serial access memory.
- The Hori (US Patent 6,407,730 B1) reference discloses a display device and method for transferring image data.
- The Babin (US Patent 6,335,720) reference discloses a synchronization method and circuit for display drivers.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid Shapiro whose telephone number is 703-305-5661. The examiner can normally be reached on 8 a.m. to 5 p.m..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 703-305-4938. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

ls
August 8, 2002



BIPIN SHALWALA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

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